

--18. The semiconductor device according to claim 17, wherein the germanium film includes at least one of a single-crystalline germanium film, a polycrystalline germanium film and an amorphous germanium film.--

--19. The semiconductor device according to claim 17, wherein the gate electrode includes a multi-layer structure having a low resistance conductive film.--

--20. The semiconductor device according to claim 19, wherein the low resistance conductive film includes at least one of a transition metal, a transition metal silicide, and a transition metal nitride film.--

--21. The semiconductor device according to claim 19, wherein the multi-layer structure is provided with a polysilicon film in between the germanium film and the low resistance conductive film.--

--22. A semiconductor device, comprising:

a metal-oxide-semiconductor field-effect transistor including:

a silicon film,

a gate insulation film on the silicon film, and

a gate electrode on the gate insulation film, the gate electrode including a germanium film on the gate insulation film,

wherein p-type impurities are doped into the germanium film, and a range of concentration of the p-type impurities is about 10^{17} to 10^{20} cm^{-3} .--

--23. The semiconductor device according to claim 22, wherein the silicon film forms a substrate structure.--

--24. The semiconductor device according to claim 22, wherein the germanium film includes at least one of a single-crystalline germanium film, a polycrystalline germanium film and an amorphous germanium film.--